TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No. POU920000020US1

In Re Application Of: **Uceda-Sosa et al.**

Serial No.	Filing Date	Examiner	Group Art Unit
09/583,694	05/31/00	Young N. Won	2155

Invention: **METHOD, SYSTEM AND PROGRAM PRODUCTS FOR AUTOMATICALLY CONNECTING A CLIENT TO A SERVER OF A REPLICATED GROUP OF SERVERS**

TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on **January 15, 2004**

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Dated: **March 09, 2004**

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#13 LDJ 3-18-04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants: Uceda-Sosa et al. Group Art Unit: 2155

Serial No.: 09/583,694 Examiner: Young N. Won

Filed: 05/31/00 Appeal No.:

For: METHOD, SYSTEM AND PROGRAM PRODUCTS FOR AUTOMATICALLY CONNECTING A CLIENT TO A SERVER OF A REPLICATED GROUP OF SERVERS

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Brief of Appellants

Dear Sir:

This is an appeal from a final rejection, dated September 17, 2003, rejecting claims 1-27, all the claims being considered in the above-identified application. This Brief is accompanied by a transmittal letter authorizing the charging of appellants' deposit account for payment of the requisite fee set forth in 37 C.F.R. §1.17(c).

Real Party In Interest

This application is assigned to **International Business Machines Corporation** by virtue of an assignment executed by the co-inventors on September 6, 7, 11, 15 & 26, 2000, and recorded with the United States Patent and Trademark Office at reel 011201, frame 0940, on October 16, 2000. Therefore, the real party in interest is **International Business Machines Corporation**.

Related Appeals and Interferences

To the knowledge of the appellants, appellants' undersigned legal representative, and the assignee, there are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the instant appeal.

Status of Claims

This patent application was filed on May 31, 2000, with the U.S. Patent and Trademark Office. As filed, the application included three (3) claims, which were independent claims (i.e., claims 1, 2 & 3).

A Preliminary Amendment was filed on April 11, 2002 by appellants adding new claims 4-27, of which none were independent claims.

In an initial Office Action dated April 23, 2003, claims 1-27 were rejected under 35 U.S.C. §102(e) as being anticipated by Ben-Shachar et al. (U.S. Patent No. 6,209,018 B1; hereinafter "Ben-Shachar"). In appellants' response dated July 23, 2003, claims 1, 2 & 3 were amended.

In a second and final Office Action dated September 17, 2003, claims 1-3 were objected to for a grammatical error, and claims 1-27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ben-Shachar et al. in view of White et al. (U.S. Patent No. 5,933,490 A; hereinafter "White"). In appellants' response dated December 4, 2003, claims 1, 2 & 3 were amended to address the grammatical claim objection.

Appellants received an Advisory Action dated December 11, 2003, which indicated that appellants' Response to the Final Office Action did not place the application in condition for allowance.

A Notice of Appeal to the Board of Patent Appeals and Interferences was filed on January 15, 2004, with a one-month extension of time request. The status of the pending claims is therefore as follows:

Claims allowed – none;

Claims objected to – none;

Claims rejected – 1-27; and

Claims canceled – none.

Appellants are appealing the rejection of claims 1-27.

Status of Amendments

In a supplemental Advisory Action received by facsimile transmission on February 4, 2004, appellants received confirmation that the amendments submitted in appellants' response to the final Office Action were entered with the filing of the Appeal. Therefore, the claims as set out in the Appendix include all prior entered claim amendments.

Summary of the Invention

A lightweight connection management protocol is provided which enables a client to connect to a server without using intermediaries and without a single point of failure. For instance, an automatic reconnection procedure (FIG. 11) is provided which enables the client of a cluster computer environment that has an unacceptable connection with one server of a group of replicated servers to reconnect with another server of the group of replicated servers.

Appellants present an approach for managing connections between clients and servers of a distributed computing environment (100, 200). The approach includes determining, by a client (nodes 4-7 of FIG. 3) of the distributed computing environment, that a server (nodes 1-3 of FIG. 3) coupled to the client, via a communications protocol that lacks individualized timeouts for individual components of the distributed computing environment, is unavailable to process requests for the client, wherein the server (602) is a member of a group of a plurality of replicated servers (600); and directly connecting (700, 800 & FIG. 9), by the client, the client to another replicated server of the group, wherein servers of the group lack knowledge of application-level information of a communication session of the client. In appellants' invention, the client directly connects itself to another replicated server of a group of replicated servers, and there are no intermediaries between the client and the server to perform the determining or the direct connection. (See specification page 14, line 15 – page 24, line 20.) Therefore, appellants' protocol is lightweight, but due to replication of the servers, still avoids a single point of failure.

Issues

1. Whether claims 1-27 were rendered obvious by Ben-Shachar in view of White.

Grouping of Claims

Since each ground of rejection provides a grouping of claims, the following group of claims is included herein:

I. Claims 1-27.

Appellants respectfully submit that the claims of Group I do not fall or stand together. For example, dependent claims 7, 8, 10, 11, 23, 24, 26 and 27 each include additional features that provide a separate basis of patentability over the applied art.

Argument

Group I: Claims 1-27

As noted, claims 1-27 stand rejected as obvious over Ben-Shachar in view of White. Reversal of this rejection is respectfully traversed.

In contrast to appellants' claimed invention, Ben-Shachar uses intermediaries to connect a client to a server. This is described throughout Ben-Shachar. For example, in FIGs. 3 and 29, it is shown that service locators are used to locate a service on a given server. Further, Col. 28, lines 59-65 describe the use of the service locator to reach a server. Yet further, in Col. 31, lines 12-13, it states: "If not, the service proxy rebinds to another service locator..." This description of a service locator being used to connect a client to a server is prevalent throughout Ben-Shachar.

The final Office Action states, "Ben-Shachar does not explicitly teach that the connecting said client to another replicated server is performed directly by said client." Since Ben-Shachar fails to teach or suggest at least this aspect of appellants' claimed invention, White is relied upon. However, appellants respectfully submit that White does not overcome the deficiencies of Ben-Shachar.

White provides an overload protection for dial-up access to the internet, which uses a hybrid network including the internet and an intelligent switched telephone network. White states:

> A service control point (SCP) in the intelligent telephone network monitors predetermined traffic criteria resulting from dial-up attempts to call the ISP. Threshold parameters are set in storage associated with the SCP, and at least certain of the measured criteria are substantially continually compared to one or more of these parameters. When one or more of the parameters is equaled or exceeded, the SCP causes redirection of calls for the first ISP to an Internet interface provided by an alternate access provider. (Abstract)

For example, if a customer cannot get access to an ISP, the customer is re-routed by the SCP which uses an alternate route provider through the internet to the ISP (e.g.,

Col. 5, lines 38-55). Thus, in White, at least one intermediary is used to connect the customer to the ISP. There is no direct connection, as claimed by appellants.

In support of the rejection, Col. 5, lines 38-48 are indicated. However, a careful reading of this section explains how an alternate route provider is used to reroute a caller via the internet to an otherwise inaccessible ISP. It is specifically stated in Col. 5, lines 44-47:

> Certain ISP customers may desire such access because they prefer the software and user interface of the ISP to the software and user interface utilized in the facility provided by the alternate route provider.

Thus, the customer uses an alternate route provider to obtain access to the ISP via the internet. Further, as described above, the customer is re-routed by the SCP. Therefore, at least one intermediary is used to connect the customer to the ISP. This is different from appellants' claimed invention in which there is no intermediary, but instead, functionality for directly connecting, by the client, the client to another server. There is no description or suggestion in White of a client directly connecting itself to another server, as claimed by appellants. Instead, White specifically teaches against direct connection by requiring intermediaries to be used.

Still further, appellants' independent claims recite that the directly connecting, by the client, of the client to another replicated server of the group of replicated servers is achieved in an environment wherein servers of the group lack knowledge of application-level information of a communication session of the client. The servers of the replicated group of servers in appellants' invention do not track communication sessions of the clients. The final Office Action alleges that column 2, lines 7-17 & column 8, lines 16-32 of Ben-Shachar teach one of ordinary skill in the art this aspect of appellants' invention. This characterization of the teachings of Ben-Shachar is respectfully traversed.

Column 2, lines 7-17 of Ben-Shachar teach that clients do not need to know

where a COBRA object resides or on which operating system the COBRA object is executed. The COBRA object equates to a server in appellants' claimed invention. Thus, column 2, lines 7-17 of Ben-Shachar teach an environment wherein the clients do not need to know the location of the servers. This is clearly different from appellants' independent claims. Appellants recite an environment where the servers lack knowledge of application-level information of a communication session of the client.

Column 8, lines 16-32 of Ben-Shachar describes workers 92, 94 and 96. As shown in FIG. 3 of Ben-Shachar, workers 92, 94 & 96 are within server 88; that is, the workers are part of the server itself. Column 8 further indicates that the workers encapsulate any connection state. Since the workers are part of the server, the server has knowledge of the client communications, and thus, the teachings of Ben-Shacher do not meet the characterizations of appellants' independent claims.

Since both Ben-Shachar and White fail to teach or suggest appellants' claimed element of directly connecting, by said client, said client to another replicated server of the group, as well as appellants' recited environment of the servers of the group lacking knowledge of application-level information of a communication session of the client, appellants respectfully submit that their invention would not have been obvious to one of ordinary skill in the art based upon the combination of Ben-Shachar and White.

Dependent claims 4-27 are believed patentable for the same reasons as the independent claims, as well as for their own additional features. For example, claims 7, 8, 10 & 11 (as well as the corresponding system claims 23, 24, 26 & 27) are believed to recite separate basis for patentability.

Claim 7 indicates that the determining by the client that a server coupled to the client is unavailable to process requests for the client includes sending a plurality of ping messages from the client to the server in accordance with a dynamic ping interval. In

comparison, Ben-Shachar describes sending of ping messages between workers within the server. This is different from appellants' recited invention, wherein functionality for determining that a server has become unavailable resides with the client (i.e., dynamic ping messages are sent to the server from the client). Ben-Shachar teaches employing ping messages only between a server and its workers.

Claim 8 specifies that the dynamic ping interval employed by the client is based on a workload level of the server. No similar functionality is taught, suggested or implied by Ben-Shachar or White. Again, Ben-Shachar describes the use of ping messages in a different manner and for a different purpose than that recited by appellants.

In claim 10, appellants recite that the directly connecting by the client includes first determining that another replicated server is available. No similar process is described in Ben-Shachar. In appellants' invention, the client first determines that another replicated server is available and then directly connects itself to that replicated server. Advantageously, appellants' invention eliminates overhead otherwise required at the group of replicated servers to monitor and maintain connections with clients.

In claim 11, appellants recite the method of claim 10, further including routing non-idempotent client requests from the another replicated server to the server if the server is still part of the group, and sending results of processing of the non-idempotent client request to the another replicated server. Since Ben-Shachar does not discuss the processing of non-idempotent requests, appellants respectfully submit that the functionality recited in their claim 11 would not have been obvious to one of ordinary skill in the art based thereon. There is no discussion in Ben-Shachar of how to handle non-idempotent requests per se, let alone the handling of such requests in a process such as recited by appellants in claim 11.

For the above reasons, appellants respectfully request reversal of the obviousness rejection to all claims of Group I.

Conclusion

Appellants respectfully request reversal of the rejection set forth in the final Office Action. Appellants submit that their claimed invention was not rendered obvious by Ben-Shachar in view of White. These patents do not individually or in combination teach, suggest or imply appellants' recited functionality of the independent claims, or certain further characterizations recited in the dependent claims.

Thus, appellants allege error in rejecting their claims as obvious over Ben-Shachar in view of White, and request reversal of the rejection.

Respectfully submitted,

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Appendix

1. A method of managing connections between clients and servers of a distributed computing environment, said method comprising:

determining, by a client of said distributed computing environment, that a server coupled to said client, via a communications protocol that lacks individualized timeouts for individual components of said distributed computing environment, is unavailable to process requests for said client, wherein said server is a member of a group of a plurality of replicated servers; and

directly connecting, by said client, said client to another replicated server of said group, wherein servers of said group lack knowledge of application-level information of a communication session of said client.

2. A system of managing connections between clients and servers of a distributed computing environment, said system comprising:

means for determining, by a client of said distributed computing environment, that a server coupled to said client, via a communications protocol that lacks individualized timeouts for individual components of said distributed computing environment, is unavailable to process requests for said client, wherein said server is a member of a group of a plurality of replicated servers; and

means for directly connecting, by said client, said client to another replicated server of said group, wherein servers of said group lack knowledge of application-level information of a communication session of said client.

3. At least one program storage device readable by a machine, tangibly embodying at least one program of instructions executable by the machine to perform a method of managing connections between clients and servers of a distributed computing environment, said method comprising:

determining, by a client of said distributed computing environment, that a server coupled to said client, via a communications protocol that lacks individualized timeouts for individual components of said distributed computing environment, is unavailable to process requests for said client, wherein said server is a member of a group of a plurality of replicated servers; and

directly connecting, by said client, said client to another replicated server of said group, wherein servers of said group lack knowledge of application-level information of a communication session of said client.

4. The method of claim 1, wherein the determining is performed by a client request broker.

5. The method of claim 1, wherein the determining comprises causing at least one ping message to be sent to the server.

6. The method of claim 5, wherein the causing comprises causing a plurality of ping messages to be sent to the server.

7. The method of claim 6, wherein the causing comprises causing the plurality of ping messages to be sent to the server in accordance with a dynamic ping interval.

8. The method of claim 7, wherein the dynamic ping interval is based on a workload level of the server.

9. The method of claim 6, wherein the determining comprises determining that a predetermined number of the plurality of ping messages have failed.

10. The method of claim 1, wherein the connecting comprises first determining that the another replicated server is available.

11. The method of claim 10, further comprising:

routing non-idempotent client requests from the another replicated server to the server if the server is still part of the group; and

sending results of processing the non-idempotent client requests to the another replicated server.

12. The system of claim 2, wherein the means for determining comprises means for determining by a client request broker.

13. The system of claim 2, wherein the means for determining comprises means for causing at least one ping message to be sent to the server.

14. The system of claim 13, wherein the means for causing comprises means for causing a plurality of ping messages to be sent to the server.

15. The system of claim 14, wherein the means for causing comprises means for causing the plurality of ping messages to be sent to the server in accordance with a dynamic ping interval.

16. The system of claim 15, wherein the dynamic ping interval is based on a workload level of the server.

17. The system of claim 14, wherein the means for determining comprises means for determining that a predetermined number of the plurality of ping messages have failed.

18. The system of claim 2, wherein the means for connecting comprises means for first determining that the another replicated server is available.

19. The system of claim 18, further comprising:

means for routing non-idempotent client requests from the another replicated server to the server if the server is still part of the group; and

means for sending results of processing the non-idempotent client requests to the another replicated server.

20. The at least one program storage device of claim 3, wherein the determining is performed by a client request broker.

21. The at least one program storage device of claim 3, wherein the determining comprises causing at least one ping message to be sent to the server.

22. The at least one program storage device of claim 21, wherein the causing comprises causing a plurality of ping messages to be sent to the server.

23. The at least one program storage device of claim 22, wherein the causing comprises causing the plurality of ping messages to be sent to the server in accordance with a dynamic ping interval.

24. The at least one program storage device of claim 23, wherein the dynamic ping interval is based on a workload level of the server.

25. The at least one program storage device of claim 22, wherein the determining comprises determining that a predetermined number of the plurality of ping messages have failed.

26. The at least one program storage device of claim 3, wherein the connecting comprises first determining that the another replicated server is available.

27. The at least one program storage device of claim 26, further comprising:

routing non-idempotent client requests from the another replicated server to the server if the server is still part of the group; and

sending results of processing the non-idempotent client requests to the another replicated server.